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Questioni di Economia e Finanza

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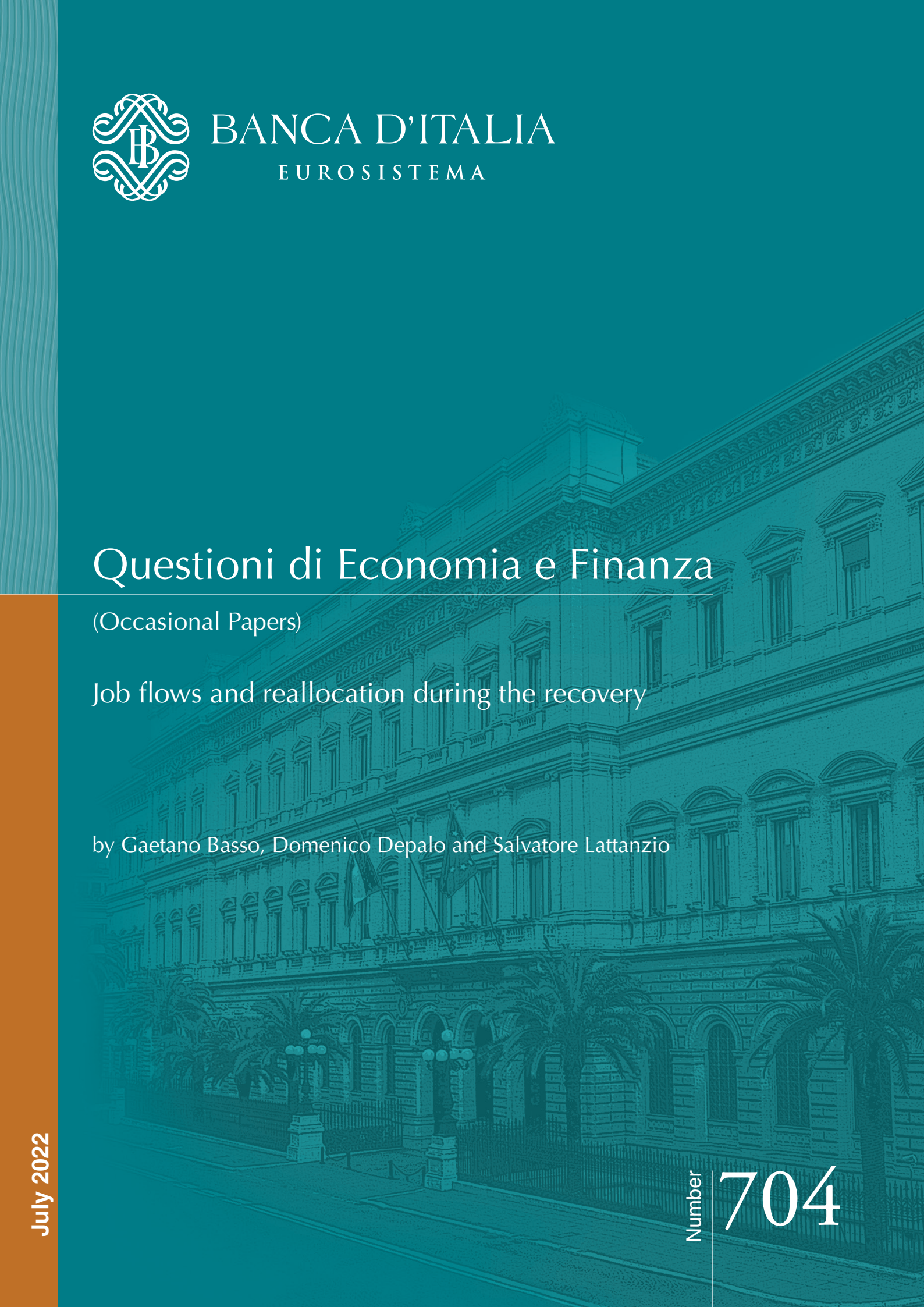
by Gaetano Basso, Domenico Depalo and Salvatore Lattanzio



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JOB FLOWS AND REALLOCATION DURING THE RECOVERY

by Gaetano Basso*, Domenico Depalo* and Salvatore Lattanzio*

Abstract

Exploiting very rich administrative data covering the period from January 2018 until December 2021, this study analyses the individual employment trajectories of a large sample of Italian workers during the pandemic and the subsequent recovery, comparing them with those of similar individuals in previous years. To understand the heterogeneous impact of the crisis on the workforce, we split the sample into three groups based on workers' labour market status in the first four months of 2020: (i) those continuously employed, (ii) those who lost their job, and (iii) those not employed (either new entrants or individuals with previous work experience). While workers in the first group were more likely to keep their job during the pandemic than they would have been in the past, those in the other groups faced scarce employment prospects. The probability of finding a job decreased sharply for labour market entrants, amplifying pre-existing differences. Finally, we did not find evidence of significant cross-firm or cross-sector reallocation.

JEL Classification: J21, J62, J63.
Keywords: employment, job mobility, turnover, Covid-19 pandemic.
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Contents

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1. Introduction*

The Covid-19 pandemic triggered an unprecedented labour market shock whose exact consequences on the labour force are not yet fully understood. While labour demand suddenly froze as the pandemic hit, the massive use of job retention schemes and a layoff ban, in place in Italy for most of 2020 and 2021 (Bank of Italy, 2021; OECD, 2021), significantly contained the potential wave of job destruction, but benefitted more employees on permanent contracts. The pandemic shock had therefore highly heterogeneous consequences, hitting employed and job seekers with different intensities, and potentially inducing a significant process of labour reallocation.

The main contribution of this paper is to investigate several dimensions of such heterogeneity. In particular, we investigate who were the most affected workers in the early stages of the pandemic, whether the subsequent recovery favoured their reallocation, and, if so, towards which sectors or employment contracts.

To address these questions, we exploit very rich administrative data on a large random sample of work relationships that have undergone a labour contract event (activation, termination). We then construct a panel of workers – about 13 per cent of the Italian workforce – for whom we observe each job and its main features (length, detailed sector and occupation) from January 2018 until December 2021. We analyse three groups of workers defined as those that between January and April 2020 (i) were continuously employed, which we define as the workers with most stable employment, (ii) those who lost their job, and (iii) those who were not employed (either new entrants or with previous work experiences). Comparing them with similar groups of workers in previous years, we uncover several important facts. In the months following the pandemic onset, workers with stable jobs fared better than those who lost or did not have a job in the first four months of 2020, thanks also to the unprecedented employment protection schemes put in place. The health emergency amplified existing differences in the duration of employment by affecting two margins: the job survival probability for those already employed (which increased relatively to the past) and the probability to find a job for non-employed workers (which decreased). Migrants, young and low-educated workers suffered most from such an increase in the between-group differences in employment status. Finally, we do not find evidence of significant cross-firm and cross-sectoral reallocation for any of the groups we analyse.

This paper contributes to the recent literature that analyses labour market flows to understand adjustments following the Covid-19 pandemic (Aaronson et al., 2021). Of particular interest for us is the work by Casarico and Lattanzio (2022) that uses the same data sources and shows that, at the very initial stage of the pandemic, hires slowed down for all workers, but more so for women, young, low-educated workers. In addition, hires or re-hires of fixed-term contracts were particularly affected. With respect to this stream of the literature, we observe individual job flow dynamics and labour market opportunities at the outbreak of the pandemic and throughout the following recovery, exploiting a longer panel.

Moreover, a large economic literature studies the role of job transitions as an indicator of the health status of the economy. Labour reallocation is generally associated with a rise in productivity and growth, both determining innovation advancements and driving the business cycle (Shimer, 2001; Davis and Haltiwanger, 2014; for a review, see Moscarini and Postel-Vinay, 2018).[1] Studying job flows is thus informative of the status of the labour market recovery post-Covid-19 pandemic and of the extent of perspective labour reallocation across sectors, productivity and wage growth.[2] Our analysis indicates that, over a time horizon of

* We would like to thank Fabrizio Balassone, Federico Cingano, Fabrizio Colonna, Francesco D'Amuri, Roberto Torrini, and Eliana Viviano for useful comments. The views expressed in this article are those of the authors and are not the responsibility of the Bank of Italy or the Eurosystem. Any error or omission is the sole responsibility of the authors.

[1] The dynamics of job-to-job transitions is also associated to earnings dynamics (Moscarini and Postel-Vinay, 2017), though with country differences that depend on labour market institutions and structural features (Berson et al., 2020).

[2] Barrero et al. (2020), Barrero et al. (2021) and Anayi et al. (2021) show that the degree of potential reallocation, and related firm expectations, have been rising since the Covid-19 shock, especially in favour of industries with remote

almost two years after the pandemic onset, job mobility across firms and sectors is still limited. Moreover, it is worth noting that the rich administrative data we use represent an advancement in the measurement of job transitions with respect to those traditionally used in the literature (Fujita et al., 2020) as they record all jobs and their detailed characteristics for a large sample of workers.

2. The data

We use data from CICO (*Campione Integrato delle Comunicazioni Obbligatorie*), a 13 per cent sample of workers obtained from the administrative system that collects mandatory notifications that employers submit to the Italian Ministry of Labour when they activate or terminate a contract.[3] For each contract, the data records the start and the end dates, the type of contract – full- or part-time and open-ended, fixed-term or apprenticeship – and, if the contract ends, the reason for its ending.[4]

We also have information on workers' demographic and personal characteristics – such as gender, year of birth and education level – and firm characteristics – such as industry. We focus on contracts in the non-agricultural private sector, from which we also exclude sectors where employers are families or supra-national organizations.[5] After this selection, we work with about 65 per cent of the initial sample. However, when we test the probability of job transitions, we keep all sectors as possible destination to properly capture workers' employment status. Finally, we drop contracts for individuals working abroad (0.03 per cent of the sample).

We use two versions of this dataset. In the descriptive analysis of labour market flows since 2020 compared to the pre-pandemic period (Section 3), each observation corresponds to a different contract.[6] Appendix A1 reports descriptive statistics about this dataset. In Sections 4.1-4.3, we focus on individuals and analyze the employment and non-employment probabilities of workers with different labour market status at the onset of the pandemic, which we conventionally define as the period between January and April 2020. This period identifies the first peak of the pandemic in Italy, when the Government introduced the most important policies, including a strict lockdown (until 4 May 2020). We convert contract-level data into a longitudinal dataset where the unit of analysis is the worker observed at a monthly frequency.[7] In what follows, for each of the years 2018, 2019, and 2020, we analyze three different groups of workers:

workable occupations. For Italy, Citino et al. (2022) show an increase in between-sector reallocation in 2021, but to a lesser extent with respect to the US.

[3] The sampling scheme is based on workers' date of birth: specifically, workers born on the 1st, 9th, 10th and 11th of each month and year with a contractual event occurring during the sample period are included in the data.

[4] Non-employment spells comprise inactivity or unemployment, as well as self-employment spells, which we are unable to distinguish. We distinguish activations in those from non-employment, from job-to-job transitions (allowing for a 1-month non-employment spell) and renewals of fixed-term contracts; we distinguish terminations in layoffs, voluntary quits, and endings of fixed-term contracts.

[5] Industry is classified according to the Italian national statistical institute (ISTAT) ATECO 2007 codes (the Italian counterpart of NACE Rev.2). We do not have an identifier for workers in the public sector. Nevertheless, we drop workers in the ATECO 2007 sectors "Public administration and defense", "Education" and "Health" where the share of public employment is predominant.

[6] For workers holding multiple contracts in overlapping periods, we assume that the main contract is the one that has the longest total duration or the one that is still active at the end of the third quarter of 2021. In case two or more contracts have the exact same duration and start in the same day, we conventionally select the contract whose firm is older. If one worker has two contracts of equal duration with two different employers in two consecutive spells, we make sure that for both spells the main employer is the same, so to avoid inflating the count of job-to-job transitions. In order to classify the contract in one of the categories defined above (see Footnote 4), we use the main one.

[7] We keep one observation per worker in each month, corresponding to the main job contract, defined as the one with the longest duration or the one that is still active in December 2021. Differently from the first part, we discard information concerning other contracts besides the main one in each month. As before, when two contracts have exact same start date and duration, we keep the contract referred to the older employer.

(i) those continuously employed between January and April;
(ii) those who lost their job at least once in the same period;
(iii) those with no observed employment relationship in the same period.

The descriptive statistics for the worker-level samples are reported in Section 4.

3. Labour market flows in 2020 and 2021 relative to 2019: descriptive evidence

3.1 Activations

We first analyse contract activations comparing the pre- and post-pandemic dynamics (Figure 1). The figure shows the per cent variation in activations in each month of 2019, 2020 and 2021 relative to the corresponding month of 2018. The pandemic imposed a massive toll: activations fell by almost 80 per cent in April 2020, and returned to the pre-pandemic monthly levels only in June 2021 (when the variation relative to 2018 is null, see panel A). Job-to-job transitions (panel B) dropped by 75 per cent in April 2020 with respect to the same month of 2018, and in 2020 were mostly below the 2018 and 2019 monthly levels. They started recovering only around June 2021 when the growth of the Italian economy was consolidating: by December 2021, job-to-job transitions were more than 25 per cent higher than in the same month of 2018. Non-employment-to-employment transitions follow by and large the pattern of aggregate flows, with considerable heterogeneity between workers who were previously employed (panel C), and those who were never employed (panel D). For the first group, non-employment to employment transitions jumped above 2018 monthly levels during the 2020 and 2021 summer seasons. For the second group, instead, transitions into employment were lower for most of 2020 and jumped back to 2018 monthly levels only in June 2021.

3.2 Separations

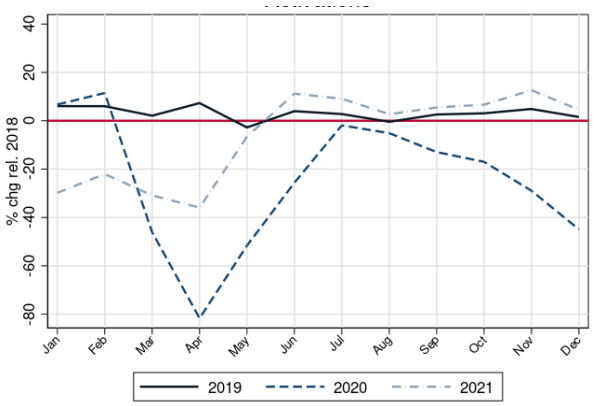
When benchmarked against 2018 (Figure 2, panel A), total separations only increased on impact (in February 2020, by approximately 20 per cent), but otherwise remained constantly below their 2018 and 2019 levels for most of the pandemic period. They returned to pre-pandemic levels only in the summer of 2021. About 70 per cent of the dynamic of separations is determined by fixed-term contracts: their terminations experienced a spike in February 2020, and remained constantly below their 2018 levels in both 2020 and 2021 (panel B). The reduction in the fixed-term contracts' terminations is partly determined by the sharp drop in the activations of fixed-term positions, whose median contractual duration was just two months before the pandemic.

The layoff ban, in place from February 2020 to October 2021, and the extensive use of short-time work compensation schemes also contributed to curbing separations.[8] Since April 2020 and throughout 2021, layoffs were between 80 and 40 per cent below their 2018 level (panel C): despite the temporary spike at the end of the layoff ban (July 2021) for firms covered by the ordinary furlough scheme the level of layoffs was still below that of the pre-pandemic period.

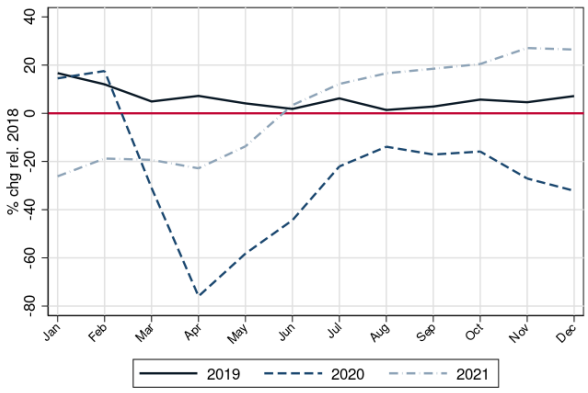
[8] The layoff ban was in place for all collective and individual dismissals motivated by economic reasons from February 23, 2020 to October 31, 2021: large firms, excluding those in the textile industry, could dismiss workers starting from July 1, 2021. It was always possible to dismiss an individual worker due to breach of contract. The layoff ban did not cover terminations of temporary contracts.

Figure 1. Monthly per cent change in activations, 2019-2021 relative to the corresponding month of 2018

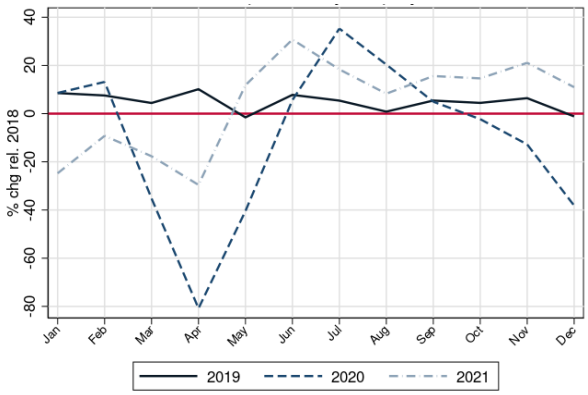
Panel A. Total activations



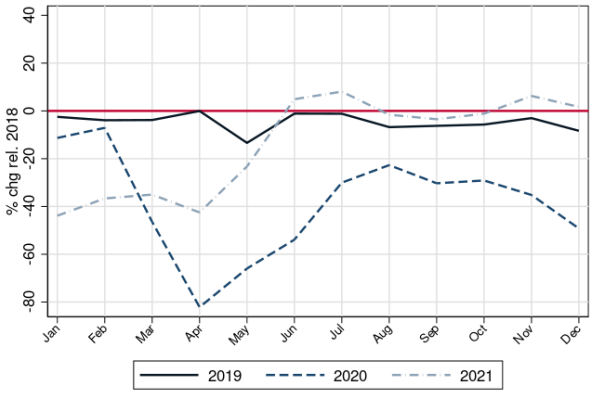
Panel B. of which: Job-to-job transitions



Panel C. of which: Non-employment to employment, previously employed



Panel D. of which: Non-employment to employment, never employed



Notes. Authors' elaborations on CICO data. Percentage differences: 2019, 2020 and 2021 with respect to 2018.

Finally, voluntary quits increased in the first months of 2020 and then dropped significantly from March 2020: they converged back to their past levels only between July and October 2020 (panel D). Following the dynamic of job-to-job transitions, they start increasing again in 2021: by December 2021, their level was 20 per cent higher than before the pandemic, recouping part of the reallocation that did not occur during the pandemic period. Such rise in quits, in fact, is consistent with the cyclical behaviour of job-to-job transitions established by the literature (Berson et al., 2020) and largely involves the booming construction sector.[9]

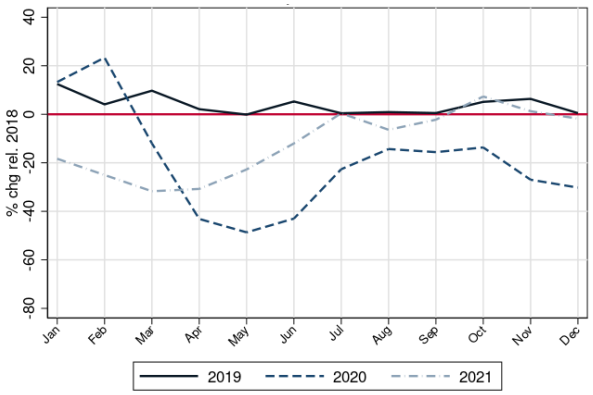
The abrupt changes in flows might have implied very different labour market outcomes between individuals who maintained their jobs during the pandemic and those who interrupted their career. The layoff ban and the use of short-time work likely benefitted most protected permanent workers who were able to keep their jobs in 2020-2021. Instead, the combined effect of the sharp reduction in non-employment to employment transitions observed in Figure 1 and of the short-lived spike in layoff and the fixed-term contract terminations in February 2020 (Figure 2) could prefigure lower employment opportunities for those more likely to hold temporary contracts and to have discontinuous careers.

[9] Additional results are available upon request. For further analyses on the scope of post-pandemic reallocation, see Citino et al. (2022).

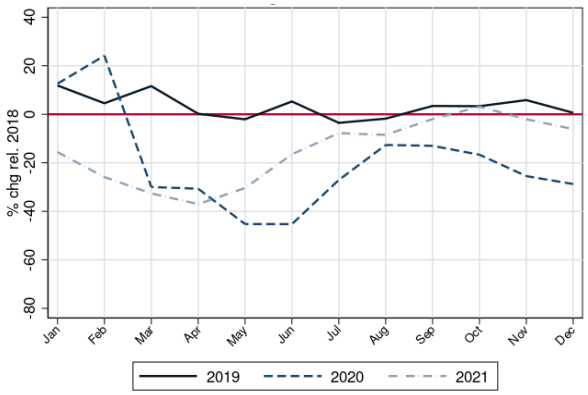
In the empirical analysis that follows, we test whether such risk materialized and what are the consequences for the individual employment status, job and sector reallocation, by distinguishing among workers who at the onset of the pandemic: (i) had stable jobs; (ii) lost their job; (iii) were non-employed.

Figure 2. Monthly per cent change in separations, 2019-2021 relative to the corresponding month of 2018

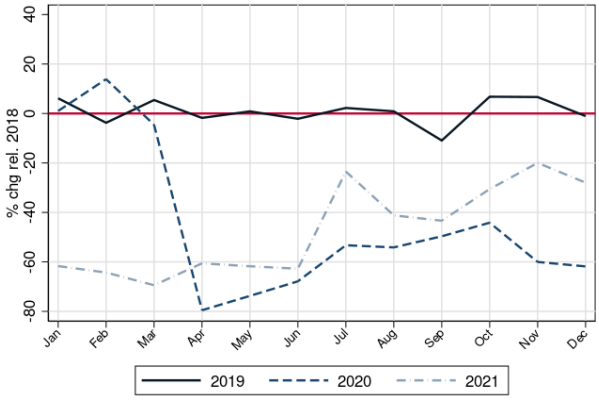
Panel A. Total separations



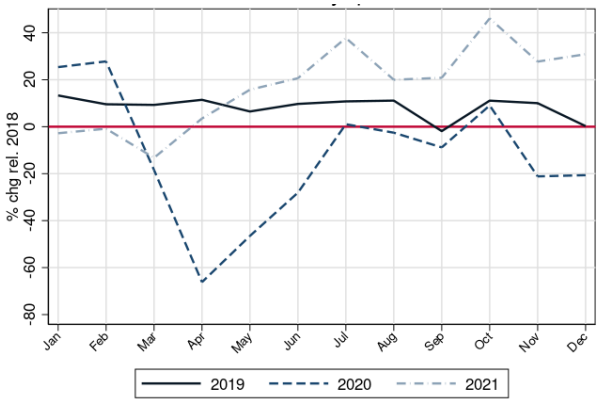
Panel B. of which: Endings of FT contracts



Panel C. of which: Layoffs



Panel D. of which: Voluntary quits



Notes. Author's elaborations on CICO data. Percentage differences: 2019, 2020 and 2021 with respect to 2018.

4. Employment prospects of workers during the pandemic and the recovery

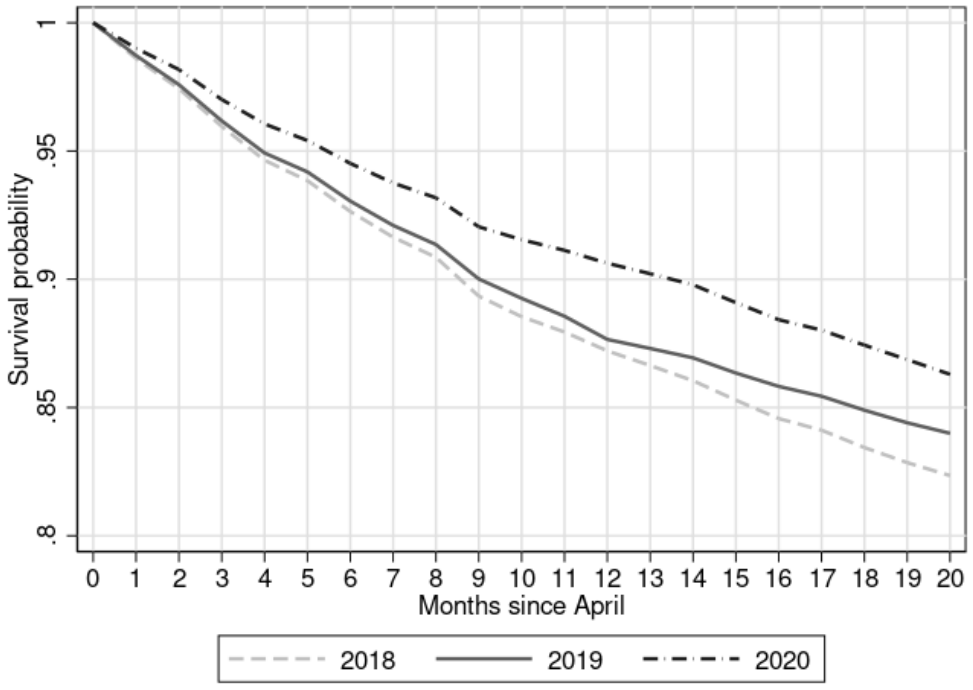
4.1. Workers with stable jobs at the onset of the pandemic

We start by investigating whether workers with stable jobs were more likely to remain employed in 2020 with respect to the past. To this end, we analyse the employment prospects of workers who are continuously employed between January and April in any of the years 2018, 2019 or 2020. We ask whether they were more likely to remain employed after April 2020, i.e., the ending of the first pandemic wave, with respect to the same window starting in April 2018 and April 2019. We follow these workers for 20 months to observe their employment transitions throughout the pandemic and subsequent recovery. Note that employment prospects of workers in 2019 at longer horizons (e.g., after 12 months) are themselves affected by the pandemic. For this reason, we will mainly focus on a comparison of 2020 with 2018.

Before proceeding to the empirical analysis, we check the main summary statistics of the sample across the three years (Appendix Table A2). The workers look largely comparable across time in terms of both demographic and job characteristics, with a slightly lower share of open-ended contracts for the 2020 sub-group. Overall, since their observed demographic characteristics are similar, the bias possibly caused by a change of individual behaviours should be negligible (see, for instance, Altonji et al. 2005).

Figure 3 shows the unconditional survival probabilities into employment for this group of workers in 2018, 2019 and 2020. The figure reports the share of workers who are still employed in each month since April. The survival probability is higher at each time horizon in 2020 with respect to 2018 and 2019, indicating higher probability of maintaining the job for workers with stable jobs in 2020 relative to the past. In 2018 and 2019, the survival probabilities overlap until the twelfth month. After that point, workers in 2019 are also affected by the pandemic (as their labour market status is observed in April-December 2020). We therefore observe that, by the twentieth month, the survival probability of being in employment is more than one percentage point higher for the 2019 group.

Figure 3. Survival probability over a 20-month period for workers with stable jobs



Notes. The figure shows the survival probability into employment over a 20-month period starting in April of 2018, 2019 and 2020, conditioning on being employed continuously between January and April of any year (2018, 2019 and 2020).

We turn to a more formal conditional analysis that controls for a number of observable worker characteristics. For the same population of Figure 3, we use a multinomial logit regression model to explain the employment status at various horizons (6, 12, 20 months since April).[10] We estimate the following equation:

[10] For this and all the following empirical analyses, we investigated also other horizons, including 18 months, which may be relevant to account for possible seasonal patterns. For the sake of brevity, we present results at 6, 12 and 20-month, which is the last available data. The differences between 18 and 20 months are small.

$$\log\left(\frac{\Pr(y_{it+h} = j)}{\Pr(y_{it+h} = J)}\right) = \alpha_j + \sum \gamma_{j,year}(1 = year) + X'_{it}\delta \quad (1)$$

where y_{it+h} represents worker i's labour market status j ($j = 1,..,4$) distinguishing between: 1) non-employment; 2) employment in the same firm; 3) employment in a different firm of the same sector; 4) employment in a different sector (the unconditional statistics for these indicators are shown in Appendix Figure A1) and h is 6, 12 or 20 months.[11] The set of covariates X contains both demographic (gender, whether immigrant, four age and three education categories) and job-related variables at time t (indicators for being in an open-ended contract, being full-time, four tenure classes, as well as one-digit occupation, region of work and sectoral dummies). The main results consider 2018 as reference year because employment outcomes of workers in 2019 are affected by the pandemic at longer horizons (as shown in Figure 3, from the twelfth month onwards).

Figure 4 reports the marginal effects of $\gamma_{j,2020}$ from equation (1), representing the change in the probability of non-employment, employment in the same firm, employment in a different firm within the same sector, employment in a different sector, between 2020 and 2018, for each horizon h. The effects estimated for this group of workers are small in magnitude, partly because Italian workers with stable job positions showed a strong survival into employment even before the crisis (Figure 3; see also Sestito and Viviano, 2018). As the pandemic hit, their probability of non-employment declined by 1 to 2 percentage points. This effect is entirely driven by the higher probability of being employed in the same firm, which is higher than in the past by 2 to 4 percentage points over the selected time horizons (such probability is always higher for workers with open-ended contracts than for those with temporary contracts).[12] Instead, cross-firm and cross-sectoral transitions are lower than in 2018 at every horizon. These results reflect both contingencies specific to the group of more stable workers (such as the strengthening of employment protection coming from the layoff ban and short time work schemes), and the more generalized reduction of turnover experienced during the pandemic crisis.

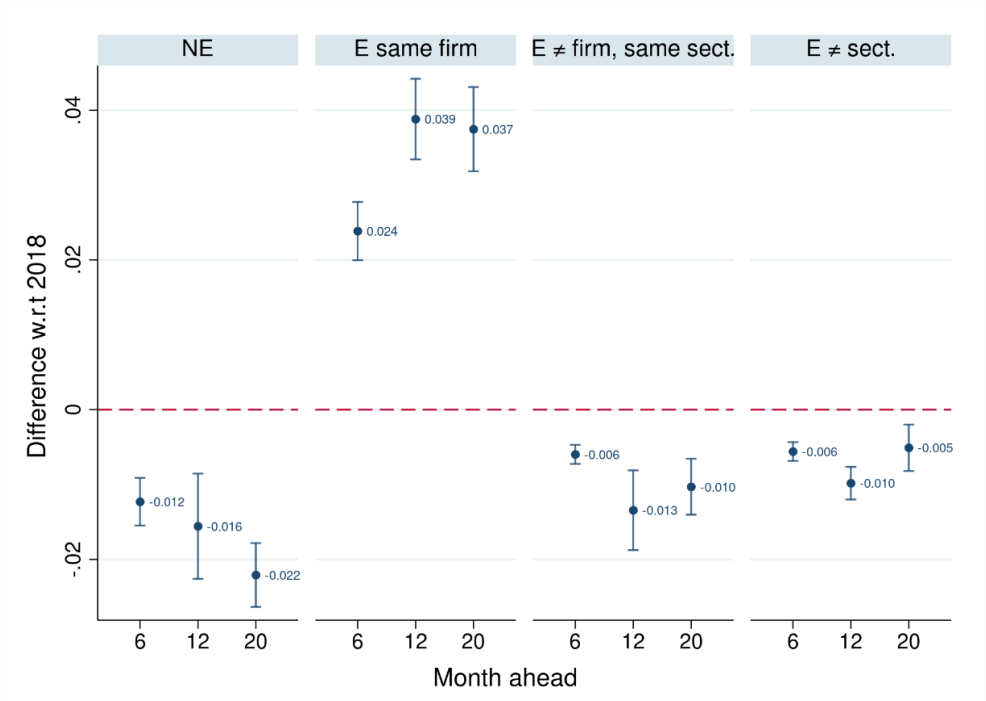
4.2. Employment prospects of workers who lost their job at the onset of the pandemic

We now investigate whether workers separating for any reason from their jobs between January and April of 2020, i.e., at the onset of the pandemic, are more or less likely to find a new job during 2020 and 2021 with respect to workers separating during the same period of 2019 or 2018. We follow these workers for 20 months after the month of job loss to observe their employment flows throughout the pandemic bust and subsequent recovery. Appendix Table A3 reports the main summary statistics of the sample across the three years, additionally distinguishing between workers losing their job in January or February and in March or April, i.e., between workers losing their job right before and right after the pandemic onset, respectively. Workers who lost their job look similar across years, with three exceptions for the group of job losers of March-April: the latter are less likely to be on open-ended contracts, they have lower tenure, and are more likely to be employed in the hospitality sector at the time of job loss. Therefore, this descriptive evidence suggests that these workers were more likely to hold fixed-term contracts that were not renewed by firms as the pandemic hit the country.

In Figure 5, we show unconditional cumulative distribution functions of re-employment probabilities since the month of job loss in each year. In 2020, the cumulative probability of finding a new job is lower with respect to the past throughout the five months following the job loss, by as much as 6 percentage points. The differential with 2018 disappears and reverses after the sixth month, indicating a faster return to work in the post-pandemic period.

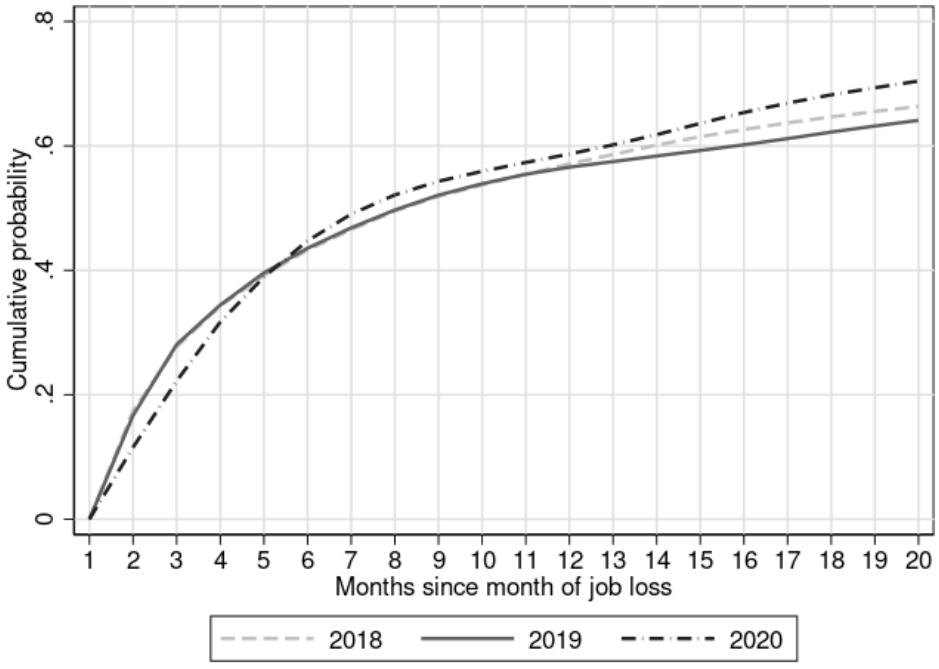
[11] The status of employment in the same firm and in a different firm at different horizons comprise both job-to-job transitions without non-employment spells and transitions with spells of non-employment.
[12] The results are not reported, but available upon request.

Figure 4. Differences in the labour market status between 2020 and 2018 for workers continuously employed between January and April



Notes. Marginal effects of the multinomial logit estimation reported in equation (1). The sample is composed of workers continuously employed between January and April (the reference year is 2018). "NE" stands for non-employment; "E same firm" for employment in the same firm; "E ≠ firm, same sect." for employment in a different firm of the same sector; "E ≠ sect." for employment in a different sector.

Figure 5. Cumulative distribution of re-employment probabilities since month of job loss, 2018-2020



Notes. The figure shows the cumulated probability of re-employment since the month of job loss over a 20-month period in 2018, 2019 and 2020, conditioning on the interruption of the previous contract between January and April.

Similar to Section 4.1, we provide a more formal analysis of the employment probabilities of workers losing their job. For the same population of Figure 5, we use a regression model to explain the employment probability at various horizons (6, 12, 20 months since the month of job loss). We estimate the following equation:

$$\log\left(\frac{\Pr(y_{it+h} = j)}{\Pr(y_{it+h} = J)}\right) = \omega_j + \zeta_{0,j}(1 = \{Mar, Apr\}) + \sum \zeta_{1,j,year}(1 = year) + \zeta_{2,j,year}(1 = year) \cdot (1 = \{Mar, Apr\}) + X'_{it}\nu, \quad (2)$$

where, as before, y_{it+h} represents worker i's labour market status j ($j = 1,..,4$) distinguishing between: 1) non-employment; 2) (re)employment in the same firm; 3) employment in a different firm of the same sector; 4) employment in a different sector. The main difference with respect to equation (1) is that we distinguish by the period of job loss, adding an interaction of the latter with year dummies ($\zeta_{2,j,year}$). We do this to better take into account the differences in the observable characteristics between workers losing their job in January or February and in March or April. We therefore report marginal effects grouping workers in those who lost their job in January and February (immediately before the outbreak of the pandemic) and those who lost their job in March and April, comparing 2020 to 2018. Job-related controls are crucial in this setting, given the aforementioned observable differences across workers.

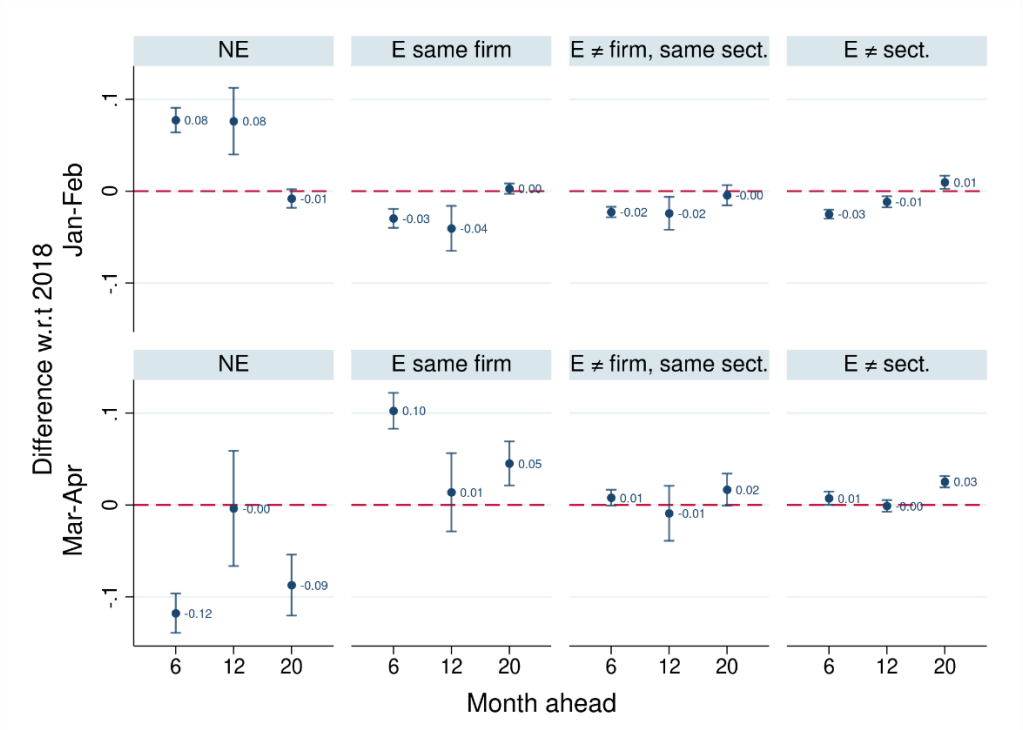
Figure 6 reports the results (for completeness, we plot the unconditional statistics of these indicators in Appendix Figure A2). The top three panels show that those who lost or interrupted their job in January and February faced the hardest time to find a new job at the 6- and 12-months horizon. The probability of non-employment, which is higher by 8 percentage points than in 2018, depends equally on the smaller probability of employment either in the same firm or in a different firm, regardless of the sector. In the longer run, after 20 months, workers losing the job in January and February 2020 closed the gap with respect to the same months of 2018, exploiting the recovery in the economic activity.

The bottom panels report the corresponding estimates for workers who lost their job in March and April. They fared better than the January-February subgroup across all horizons. The probability of being employed in the same firm, which is largely determined by workers on fixed-term contracts, almost entirely explains those patterns. Employment at different firms plays a minor role, highlighting little labour reallocation in the aftermath of the pandemic.

The difference in labour market status for workers losing the job in January-February and March-April likely reflects a combination of both supply and demand factors. Separations in January and February are more likely to reflect already-planned terminations of fixed-term contracts and voluntary quits of workers who then faced an unexpected negative shock that hampered their labour market prospects. Separations in March and April likely reflect a more intensive use of fixed-term contracts for flexibility purposes.[13] This interpretation is coherent with the differences in workers' observable characteristics and sectoral job opportunities between the two groups discussed at the beginning of this Section. With respect to the January-February group, the March-April one is more likely to hold fixed-term contracts, has lower tenure with the firm and is more likely to work in the hospitality sector at the time of job loss (Table A3).

[13] During the pandemic, the limit on the number of 4 renewals of fixed-term contracts was suspended (art. 93, Decree n. 34/2020).

Figure 6. Differences in the labour market status between 2020 and 2018 for workers losing their job between January and April



Notes. Marginal effects of the multinomial logit estimation reported in equation (1). The sample is composed of workers who lost the job between January and April (the reference year is 2018). The top three panels report coefficients for workers losing their job in January and February. The bottom three panels report coefficients for workers losing their job in March and April. "NE" stands for non-employment; "E same firm" for employment in the same firm; "E ≠ firm, same sect." for employment in a different firm of the same sector; "E ≠ sect." for employment in a different sector.

4.3. Employment prospects of workers not employed at the onset of the pandemic

Finally, we investigate the employment prospects of the workers not employed in any day between January and April of 2020. As above, we focus on the patterns of their employment probability, relative to workers in similar conditions in the same months of 2018 and 2019.[14] This population is further split into two sub-groups of individuals: those with previous labour market experience before the reference period and those without.[15] We provide separate discussions for the two groups.

Workers with previous labour market experience. Figure 7 shows the cumulative probability of re-employment since April in each year, indicating that, at all horizons, non-employment to employment transitions were less likely in 2020 than in the two previous years. Our regression analysis reveals that such differential is almost entirely driven by workers with the longest non-employment spell. This is obtained by estimating a conditional logit model of re-employment-since-April:

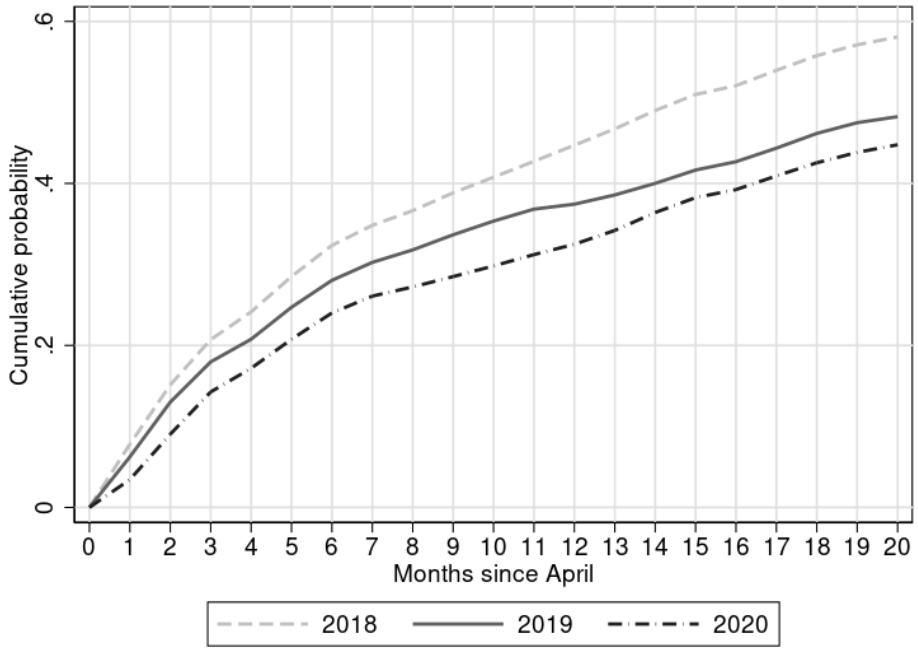
[14] Appendix Table A4 compares the three groups' by demographic characteristics. Workers in 2020 are slightly older, more likely to be migrants and with lower secondary education than those in 2018 or 2019.

[15] For those with previous labour market experience, we further distinguish between those with short and long non-employment spells, defined as those that last for less or more than 6 months, respectively. We use this threshold because it is the one usually set by the Government, for example for hiring subsidies in favour of "long-term unemployed". For the never employed subgroup, we assume that workers start searching a job in the 12 months before finding the first one, thus allowing for a 12-month non-employment spell before the first employment event.

$$\Pr(E_{it+h} = 1) = \alpha_j + \sum \gamma_{j,year}(1 = year) + X'_{it}\delta, \quad (3)$$

where E_{it+h} represents worker i's employment status. The analysis is run separately for 1) non-employed workers with a short non-employment spell (i.e., of at most 6 months over the previous year); 2) non-employed workers with a long non-employment spell (i.e., equal to or longer than 6 months). The reference category is the 2018 group.

Figure 7. Cumulative re-employment probability since April in 2018, 2019 and 2020

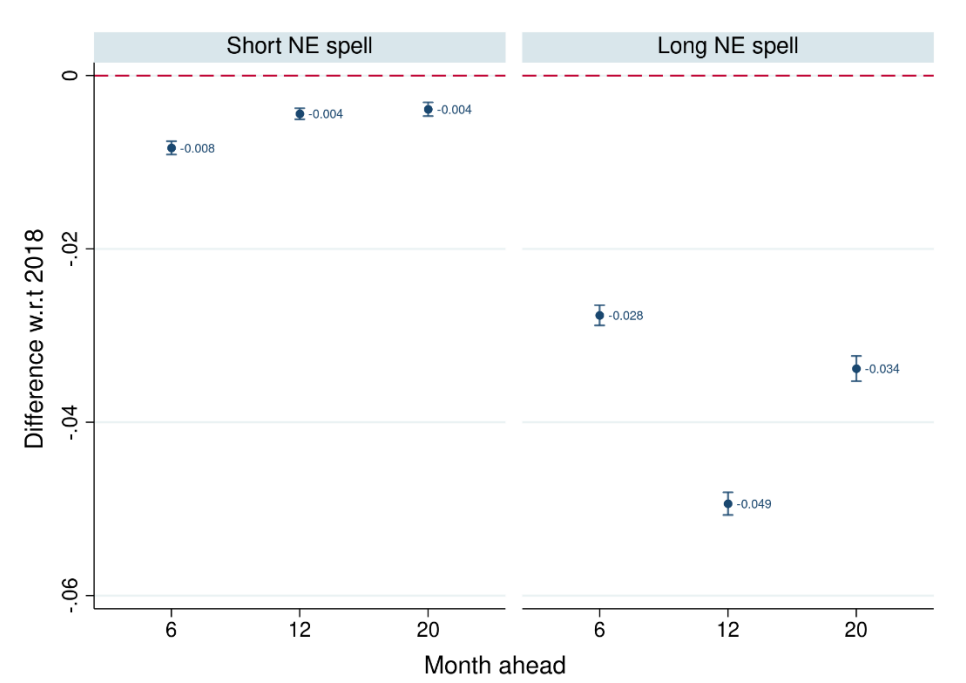


Notes. The figure shows the cumulative probability of re-employment since April over a 20-month period in 2018, 2019 and 2020, conditioning on not being employed between January and April.

The results show that, in 2020, the probability of re-employment is significantly lower for both groups, but with considerable heterogeneity (Figure 8). In particular, whilst workers with previous short non-employment spells were only marginally affected in their probability of finding a job (left panel), workers with longer non-employment spells (right panel) sustained much of the burden, both as an absolute probability change (see Appendix Figure A.3) and with respect to the 2018 level. Interestingly, employment probability for the long-term non-employed was still 4 percentage points lower than in 2018 after 20 months (in December 2021). Such differences are particularly worrying because they are larger for low-educated and young workers.[16] Thus, the pandemic may have exacerbated the difficulty for these groups – which experience substantial hurdles also in normal times – to find a job with potential long-run scarring effects (von Wachter, 2020).

[16] The results, not reported, are available upon request.

Figure 8. Differences in re-employment probability between 2020 and 2018 for workers not employed between January and April



Notes. Marginal effects of multinomial logit estimation reported in equation (3), but not including job-related controls. The sample is composed of workers who were not employed between January and April (the omitted year is 2018), with a previous employment relationship. "Short NE spell" for employment for workers with a short non-employment spell (less than 6 months), "Long NE spell" for employment for workers with a long non-employment spell (at least 6 months).

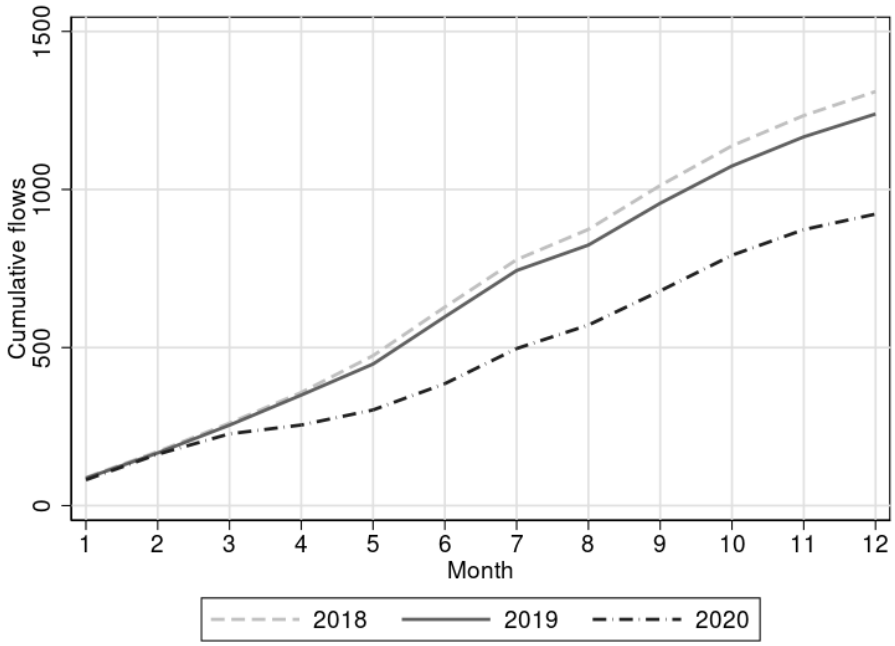
New entrants. Finally, our data allows studying the patterns of labour market entry. That is, the flows into employment of individuals never employed before. It is worth emphasizing that we do not observe the universe of non-employed workers, because our data do not record those who were about to enter the labour market, but failed to find a job.

Figure 9 shows the cumulative flows of the number of workers entering employment for the first time in each year. In January and February, flows are comparable in magnitude across years. Starting from March, the patterns begin to diverge: by the end of 2020, we estimate approximately 344,000 (28 per cent) and 282,000 (24 per cent) fewer entries than in 2018 and 2019, respectively.[17]

The shrinking cohorts of entrants changed in terms of demographic characteristics (Table 1). In 2020, labour market entrants are more likely to be women (45 per cent, versus 43 and 41 per cent in 2019 and 2018, respectively) and less likely to be migrants (29 versus 32 and 34 per cent, respectively). They are approximately one year older (30.5 versus 29.1 and 29.3, respectively) and are more likely to have attended college (15 versus 12 per cent, respectively). These differences are statistically significant at 1 per cent level, signalling a change in the composition of workers.[18]

[17] These numbers refer to the entire country. We re-weighted the sample to make it representative of the entire population.
[18] The decrease in the number of new entrants continues in 2021 (-14 per cent) and is not explained by population ageing. We test the impact of ageing on the decline in new entries by running a regression of the log number of new entrants in cells defined by the region of residence, gender and age (in 1-year groups, from 15 to 64 years old) on year dummies without and with the inclusion of log population in each cell among the controls. Results are reported in Table A5. When

Figure 9. Cumulative flows of workers entering employment for the first time



Notes. The figure shows the cumulative number of workers in 2018, 2019 and 2020 who enter the labor market for the first time for each month.

Table 1. Demographic characteristics of new entrants in the labour market in each year.

	2018		2019		2020
	(1)	(2)	(3)	(4)	(5)
Female	0.41	***	0.43	***	0.45
Migrant	0.34	***	0.31	***	0.28
Age	29.76	***	29.85	***	31.17
Lower secondary school	0.60	***	0.58	***	0.55
Upper secondary school	0.30	***	0.31	**	0.31
College or more	0.10	***	0.11	***	0.14
Observations	136,488		127,542		95,314

Notes. The table reports means of demographic characteristics of workers entering the labor market in 2018, 2019 and 2020 in columns (1), (3), and (5), respectively. T-test of the difference between 2020 and 2018 and 2019 were conducted. Significance stars are reported in columns (2) and (4). Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5. Conclusions

The Covid-19 pandemic hit workers very hard and in a highly heterogeneous fashion with potentially long lasting consequences for many of them. In this paper, we use timely and detailed administrative data on job contracts to compare the outcomes of workers with different employment status at the onset of the pandemic. Our results suggest that the policies introduced during the pandemic, namely the layoff ban and short-time work schemes, which targeted almost exclusively job holders, and the overall lower turnover during the crisis

controlling for population in column (2) the coefficients on the year dummies are almost unaffected (-28 vs -27 log points in 2020).

period increased the duality in the Italian labour market. Whilst workers with stable jobs were more likely to be employed than in the past over the course of a 20-month period, for those who lost their jobs during the pandemic finding a new position was particularly difficult, especially if they had long periods of non-employment. The probability to find a job for the new entrants in the labour market shrank dramatically. Such negative consequences for new entrants may last well beyond the pandemic. Importantly, our analysis also suggests that the subsequent recovery was *not* associated with cross-firm or cross-sector job mobility. That is, the amount of labour reallocation was limited and a rise in job-to-job transitions is observed only in the last months of 2021.

Our evidence rests on important assumptions. First, we assume that the two years prior to 2020 are a good counterfactual of what would have happened in the labour market in the absence of the pandemic: the empirical evidence we provide supports such assumption, as we document little differences in the groups of workers we analyse across years. Second, we assume that no unobservable changes in behaviour occurred, which could have lowered labour market participation in the Covid-19 period. However, even if these discouraging effects, which were particularly pronounced at the spike of the first pandemic waves (Anelli and Koenig, 2021; Depalo and Viviano, 2021), were still in place almost two years into the recovery, we could still interpret our findings as the employment effects of the pandemic-induced labour market disruption.

It is worth noting that our data are subject to some limitations. First, we do not have any information on wages, nor on individual income or family structure that are relevant outcomes in this context and likely impact workers' behaviour. Second, we have no information about the extent of labour search of the non-employed nor on informal employment. Further research on both these important aspects is warranted. Yet, the timely evidence we provide is of crucial relevance for policy makers to monitor the labour market evolution and to implement policies that target the workers most affected by labour market disruptions. In a context where labour demand is increasing sharply thanks to the post-pandemic rise in public and private investments, policies that favour the match between jobs and new entrants would improve the short- and long-term employment prospects of the most affected groups, partially compensating the missed opportunities they have been facing since February 2020.

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Appendices

A1. Description of the CICO sample and of the subsamples used in the analysis

Table A1 reports the summary statistics of the full CICO dataset and of the one used in the analysis, which only considers contracts activated from January 2018. CICO contains 19.7 million contracts, 6.6 million of which activated after 2018. Approximately three quarters of such contracts are identified as "main" and are used to classify activations into job-to-job or non-employment to employment transitions. The share of contracts in the private non-agricultural sector is slightly larger in the full sample than in the one starting from 2018 (65.7 vs 65.1 per cent), whereas the share of men is slightly larger in the latter (58 vs 55 per cent). The dataset contains a total of 3.8 (2.0) workers and 2.7 (1.2) employers in the full (analysis) sample. Each worker holds 5.1 contracts on average in the full sample and 3.1 contracts in the analysis sample. The average number of contracts per employer are 7.4 and 5.7, respectively, while the number of workers per employer is around 1.5-2.

Table A1. Descriptive statistics about CICO

	(1)	(2)	(3)	(4)
	All		**From 2018**	
	count	share	count	share
All	19,691,476		6,553,485	
PNA	12,932,295	*65.67*	4,269,286	*65.15*
Outside PNA	6,759,181	*34.33*	2,284,199	*34.85*
Manufacturing	1,764,835	*8.96*	524,085	*8.00*
Men	10,813,051	*54.91*	3,772,375	*57.56*
Women	8,878,425	*45.09*	2,781,110	*42.44*
North	10,284,417	*52.23*	3,444,310	*52.56*
Centre	4,571,581	*23.22*	1,508,562	*23.02*
South	4,849,788	*24.63*	1,597,062	*24.37*
Abroad	5,994	*0.03*	1,841	*0.03*
Main	14,787,825	*75.10*	4,743,612	*72.38*
Workers	3,863,348		2,010,108	
Employers	2,652,376		1,157,454	
Contracts per worker	5.10		3.26	
Contracts per employer	7.42		5.66	
Workers per employer	1.46		1.74	

Notes. Authors' elaborations on CICO dataset. Counts of contracts for different groups are reported in the top panel. The middle panel reports counts of workers and employers. The bottom panel reports the ratio of the number of contracts over number of workers and employers and of the number of workers over number of employers.

Table A2. Summary statistics: sample of workers continuously employed in January-April of each year

	(1) Year 2018	(2) Year 2019	(3) Year 2020
Female	0.39	0.38	0.38
	(0.487)	(0.486)	(0.486)
Migrant	0.17	0.18	0.19
	(0.378)	(0.385)	(0.390)
Age	39.67	39.47	39.29
	(11.76)	(11.72)	(11.61)
Lower secondary school	0.52	0.52	0.51
	(0.500)	(0.500)	(0.500)
Upper secondary school	0.37	0.37	0.37
	(0.482)	(0.482)	(0.483)
College or more	0.11	0.11	0.12
	(0.317)	(0.319)	(0.322)
Open-ended contract	0.50	0.46	0.44
	(0.500)	(0.499)	(0.497)
Full-time contract	0.62	0.61	0.61
	(0.486)	(0.487)	(0.488)
Tenure (months)	60.38	57.67	56.29
	(79.26)	(71.31)	(61.60)
North	0.55	0.56	0.55
	(0.497)	(0.497)	(0.497)
Centre	0.21	0.21	0.21
	(0.409)	(0.409)	(0.409)
South	0.23	0.23	0.23
	(0.423)	(0.422)	(0.424)
Manufacturing	0.26	0.25	0.25
	(0.437)	(0.436)	(0.434)
Hospitality	0.22	0.23	0.23
	(0.418)	(0.418)	(0.418)
Other services	0.26	0.26	0.26
	(0.437)	(0.436)	(0.436)
Wholesale and retail trade	0.18	0.18	0.19
	(0.387)	(0.387)	(0.390)
Constructions	0.08	0.08	0.08
	(0.269)	(0.271)	(0.272)
Observations	1,196,688	1,244,493	1,276,381

Notes. Authors' elaborations on CICO data. The table reports the average values of the main workers and jobs' characteristics for the sample of workers continuously employed in January-April of each year (standard deviations in parentheses).

Table A3. Summary statistics: sample of workers losing job in January-April of each year

	(1)	(2)	(3)	(4)	(5)	(6)
	Year 2018		Year 2019		Year 2020	
	Jan-Feb	Mar-Apr	Jan-Feb	Mar-Apr	Jan-Feb	Mar-Apr
Female	0.38	0.39	0.38	0.37	0.38	0.39
	(0.486)	(0.487)	(0.486)	(0.484)	(0.486)	(0.487)
Migrant	0.24	0.25	0.25	0.26	0.26	0.26
	(0.425)	(0.432)	(0.431)	(0.436)	(0.439)	(0.440)
Age	38.46	38.83	38.30	39.27	38.62	38.83
	(12.26)	(12.29)	(12.35)	(12.78)	(12.74)	(12.49)
Experience	79.63	82.21	82.27	87.63	89.41	91.36
	(72.47)	(76.03)	(73.54)	(80.59)	(80.19)	(76.71)
Lower secondary school	0.64	0.66	0.64	0.66	0.65	0.66
	(0.480)	(0.475)	(0.481)	(0.475)	(0.478)	(0.472)
Upper secondary school	0.32	0.30	0.32	0.30	0.32	0.30
	(0.465)	(0.460)	(0.467)	(0.460)	(0.465)	(0.460)
College or more	0.04	0.04	0.04	0.04	0.04	0.03
	(0.201)	(0.200)	(0.203)	(0.196)	(0.192)	(0.178)
Open-ended contract	0.28	0.26	0.26	0.24	0.24	0.12
	(0.450)	(0.436)	(0.439)	(0.427)	(0.427)	(0.325)
Full-time contract	0.52	0.56	0.51	0.55	0.50	0.52
	(0.500)	(0.497)	(0.500)	(0.497)	(0.500)	(0.500)
Tenure (months)	23.63	24.22	22.33	24.99	24.15	16.96
	(61.55)	(65.89)	(58.48)	(69.95)	(66.97)	(56.27)
North	0.45	0.50	0.46	0.50	0.46	0.52
	(0.498)	(0.500)	(0.498)	(0.500)	(0.499)	(0.500)
Centre	0.22	0.20	0.22	0.20	0.22	0.20
	(0.412)	(0.400)	(0.411)	(0.403)	(0.414)	(0.399)
South	0.33	0.30	0.33	0.29	0.32	0.28
	(0.470)	(0.457)	(0.469)	(0.456)	(0.465)	(0.450)
Manufacturing	0.16	0.17	0.16	0.16	0.15	0.15
	(0.369)	(0.374)	(0.363)	(0.370)	(0.356)	(0.353)
Hospitality	0.34	0.35	0.35	0.36	0.38	0.42
	(0.474)	(0.477)	(0.478)	(0.480)	(0.485)	(0.494)
Other services	0.21	0.22	0.22	0.22	0.22	0.19
	(0.411)	(0.417)	(0.412)	(0.416)	(0.414)	(0.395)
Wholesale and retail trade	0.16	0.14	0.16	0.14	0.15	0.13
	(0.370)	(0.346)	(0.371)	(0.345)	(0.356)	(0.340)
Constructions	0.12	0.12	0.11	0.12	0.11	0.11
	(0.325)	(0.325)	(0.312)	(0.321)	(0.307)	(0.310)
Observations	47,437	50,285	47,344	52,382	53,363	58,009

Notes. Authors' elaborations on CICO data. The table reports the average values of the main workers and jobs' characteristics for the sample of workers losing their job between January and April of each year, separating workers into those losing job in January-February and in March-April (standard deviations in parentheses).

Table A4. Summary statistics: sample of workers who are continuously non-employed in January-April of each year

	(1) Year 2018	(2) Year 2019	(3) Year 2020
Female	0.45	0.45	0.45
	(0.498)	(0.498)	(0.498)
Migrant	0.25	0.27	0.28
	(0.434)	(0.444)	(0.451)
Age	39.99	40.46	40.91
	(12.17)	(12.59)	(12.88)
Experience	87.26	93.25	99.51
	(69.63)	(78.60)	(84.16)
Lower secondary school	0.65	0.66	0.66
	(0.477)	(0.474)	(0.472)
Upper secondary school	0.27	0.27	0.27
	(0.446)	(0.444)	(0.445)
College or more	0.08	0.07	0.06
	(0.264)	(0.253)	(0.243)
Observations	506,657	581,760	686,966

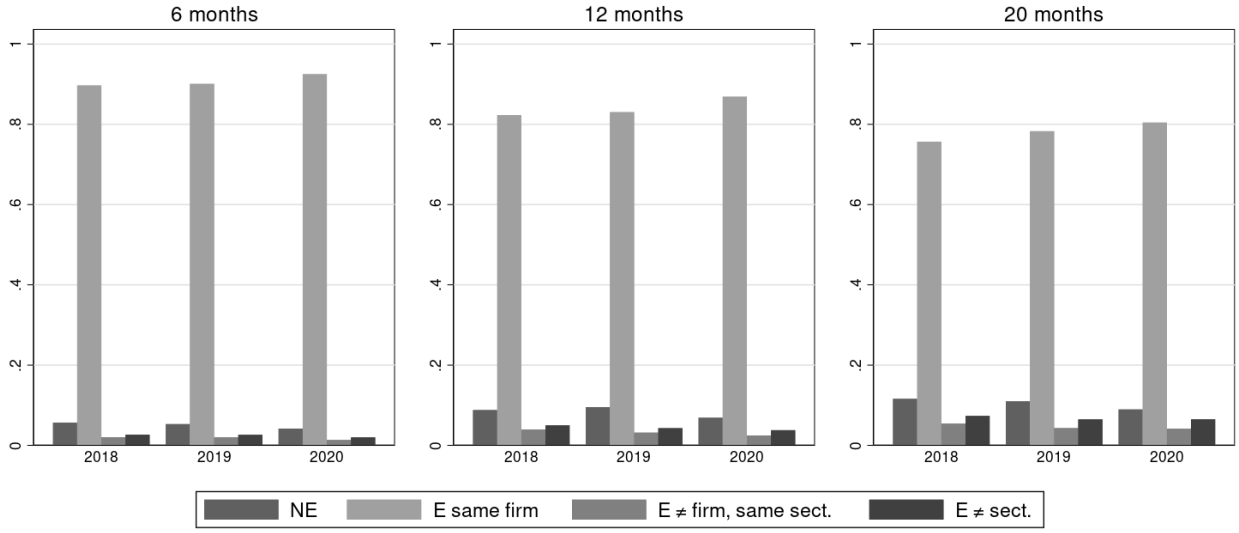
Notes. Authors' elaborations on CICO data. The table reports the average values of the main workers and jobs' characteristics for the sample of workers who are continuously non-employed between January and April of each year (standard deviations in parentheses).

Table A5. Impact of the pandemic on the log number of new entrants, OLS regressions

	(1)	(2)
2019	-0.05	-0.04
	(0.04)	(0.03)
2020	-0.28***	-0.27***
	(0.04)	(0.03)
2021	-0.16***	-0.14***
	(0.04)	(0.03)
Log population		0.84***
		(0.01)
Constant	5.66***	-2.16***
	(0.03)	(0.09)
Observations	8146	8146
R-squared	0.007	0.495

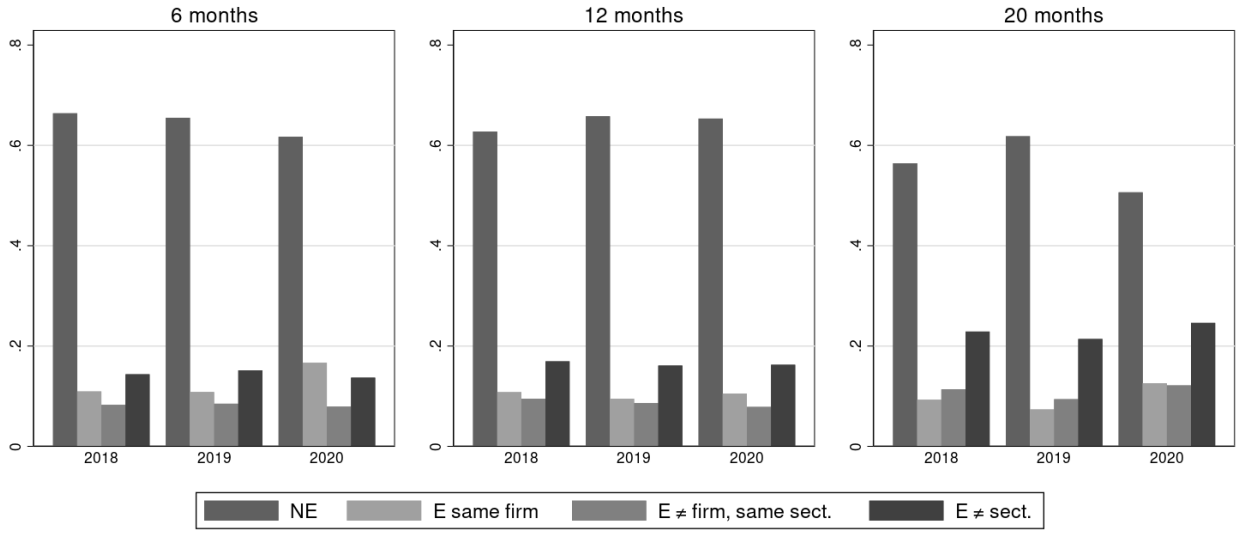
Notes. The table reports results of OLS regressions of the number of new entrants in cells defined by region, gender and age (from 15 to 64) on year dummies in column (1), and additionally on log population in each region-gender-age cell in column (2). Robust standard errors in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure A1. Employment status of workers continuously employed between January and April of each year



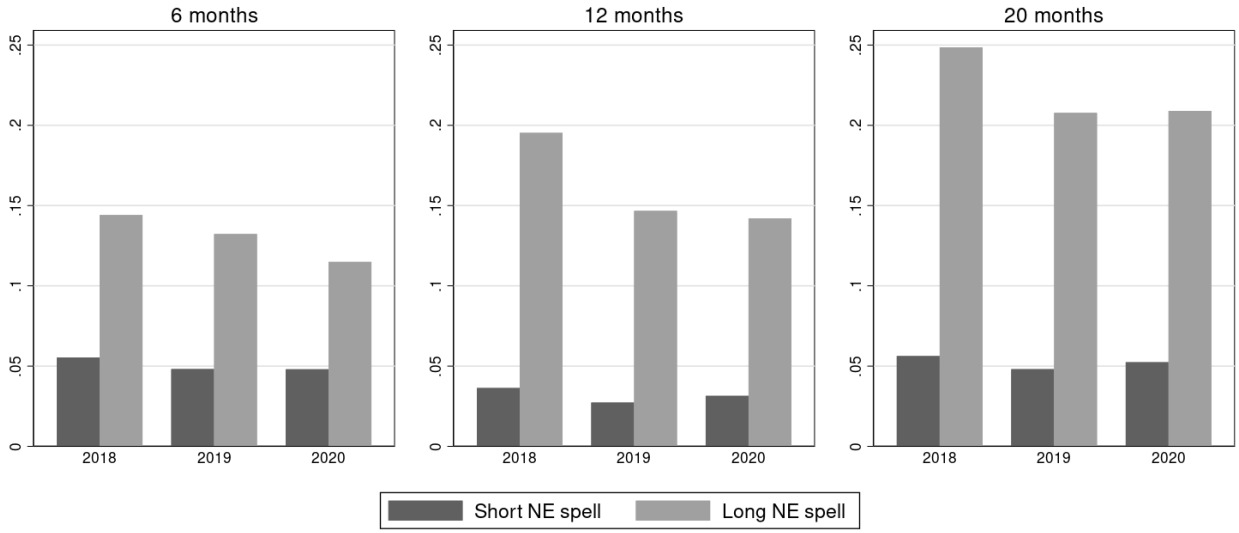
Notes. The figure reports the employment status of workers who are continuously employed between January and April of each year (reported on the horizontal axis). Each bar equals the share of workers who are non-employed ("NE"), employed in the same firm ("E same firm"), employed in a different firm within the same sector ("E ≠ firm, same sect."), employed in a different sector ("E ≠ sect."), at different time horizons since April: 6 months (left panel), 12 months (middle panel), 20 months (right panel).

Figure A2. Employment status of workers losing their job between January and April of each year



Notes. The figure reports the employment status of workers who lose their job between January and April of each year (reported on the horizontal axis). Each bar equals the share of workers who are non-employed ("NE"), employed in the same firm ("E same firm"), employed in a different firm within the same sector ("E ≠ firm, same sect."), employed in a different sector ("E ≠ sect."), at different time horizons since the month of job loss: 6 months (left panel), 12 months (middle panel), 20 months (right panel).

Figure A3. Employment status of workers not employed between January and April of each year



Notes. The figure reports the employment status of workers who are not employed between January and April of each year (reported on the horizontal axis). Each bar equals the share of workers who are employed after a non-employment spell of less than 6 months ("Short NE spell") or equal to or longer than 6 months ("Long NE spell"), at different time horizons since April: 6 months (left panel), 12 months (middle panel), 20 months (right panel).